

University of Groningen

Task-related Interactions between Kindergarten Children and their Teachers

Thijs, Jochem T.; Koomen, Helma M.Y.

Published in:
Infant and Child Development

DOI:
[10.1002/icd.552](https://doi.org/10.1002/icd.552)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2008

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Thijs, J. T., & Koomen, H. M. Y. (2008). Task-related Interactions between Kindergarten Children and their Teachers: The Role of Emotional Security. *Infant and Child Development*, 17(2), 181.
<https://doi.org/10.1002/icd.552>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Task-related Interactions between Kindergarten Children and their Teachers: The Role of Emotional Security

Jochem T. Thijs^{a,*} and Helma M. Y. Koomen^b

^a *Utrecht University, Utrecht, The Netherlands*

^b *University of Amsterdam, Amsterdam, The Netherlands*

This study examined the emotional security of kindergarten children in dyadic task-related interactions with their teachers. In particular, it examined the interrelations between security, task behaviours (persistence and independence), social inhibition, and teachers' support. Participants were 79 kindergartners (mean age = 69.7 months) and their 40 regular teachers. Children were selected to approach a normal distribution of social inhibition. Children and teachers were filmed during a dyadic interaction task outside the classroom. Three groups of independent observers rated children's emotional security and their task behaviours, as well as teachers' supportive behaviours. Multi-level modelling revealed a positive link between teachers' support and emotional security. This link suppressed a negative relation between social inhibition and emotional security. In addition, emotional security was positively associated with children's task behaviours and mediated part of the positive link between these behaviours and teachers' support. Finally, security moderated the relation between support and persistence, such that the effect of teachers' support on persistent behaviours was amplified for relatively insecure children. These results highlight the importance of considering emotional security when examining the interactions between kindergarten children and their teachers. Copyright © 2008 John Wiley & Sons, Ltd.

Key words: emotional security; social inhibition; teachers' support; kindergartners; task behaviours

INTRODUCTION

Emotional security, a key construct within attachment theory, is used to describe and explain regulatory processes that take place in attachment relationships and

*Correspondence to: Jochem T. Thijs, Faculty of Social Sciences, Utrecht University, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands. E-mail: J.T.Thijs@uu.nl

in the wider family environment (Cummings & Davies, 1996; Davies & Cummings, 1998). The construct of emotional security has also been successfully applied to children's functioning in school situations, especially those involving their teachers (Howes, Hamilton, & Matheson, 1994; Koomen, van Leeuwen, & van der Leij, 2004; Little & Kobak, 2003). Teachers can function as secondary attachment figures (Ainsworth, 1991): in times of stress children appear to rely on teachers for support and security (Barnas & Cummings, 1994; Koomen & Hoeksma, 2003; Pianta, 1992; van IJzendoorn, Sagi, & Lambermon, 1992). Accordingly, emotional security appears to play an important role in the academic functioning of young children. The present study examined this role by observing dyadic task-related interactions between kindergarten children and their teachers. More specifically, the study focused on two potential influences and two potential outcomes of children's states of emotional security: respectively, social inhibition and teachers' support, and independence and task persistence.

EMOTIONAL SECURITY, SOCIAL INHIBITION, AND TEACHERS' SUPPORT

Davies and Cummings (1994) formulated an emotional security hypothesis, which posits that the preservation and attainment of emotional security is a primary goal for children. More than attachment theory, this approach stresses the functions and goals of emotional security in specific contexts (Davies & Cummings, 1998). Emotional security is conceived of as a state assumed to reflect the immediate transaction between children's environment and their personal characteristics, including relationship representations and temperamental factors. This state serves a motivational function, in the sense that threats to security are hypothesized to activate an internal regulatory system aimed at preserving or restoring optimal levels of well-being (Cummings & Davies, 1996; Davies & Cummings, 1998).

In the present research, social inhibition was examined as a personal characteristic that increases children's susceptibility to reduced emotional security. Like other emotional or behavioural problems (van den Oord, Pickles, & Waldman, 2003), social inhibition tends to have a skewed distribution (see Thijs, Koomen, de Jong, van der Leij, & van Leeuwen, 2004). Therefore, in this study, we used a selection strategy to maximize the participation of extremely inhibited children, and to approach a normal distribution of this variable, which increased the probability of finding significant effects. Social inhibition refers to the disposition to be anxious and wary in novel or challenging social situation (Asendorpf, 1993; Crozier, 1999; Kagan, 1997). It appears to have a temperamental basis (Kagan, 1997; Rubin, Burgess, & Hastings, 2002) but is related to insensitive parenting behaviours as well (see Coplan, Prakash, O'Neil, & Armer, 2004). Social inhibition has been identified as a risk factor for various socio-emotional problems, including loneliness, depression, social incompetence, social isolation, and peer rejection (Coplan & Rubin, 1998; Coplan, Rubin, Fox, Calkins, & Stewart, 1994; Gazelle & Ladd, 2003). Although there are indications that inhibited children share unfavourable (dependent and distant) relationships with teachers (Birch & Ladd, 1998; Ladd & Burgess, 1999), little is known about how social inhibition is manifested in actual (i.e. observed) teacher-child interactions (Coplan & Prakash, 2003; Thijs, Koomen, & van der Leij, 2006). To our knowledge two observation studies bear upon this issue. Rimm Kaufmann *et al.* (2002) found that, compared with socially bold children, socially wary children had fewer

interactions with their teachers and, probably as a consequence, were less likely to comply with teachers' requests. Coplan and Prakash (2003) took a different approach and compared preschoolers who had different interactions with their teachers. Their results indicate that children who show little initiative in interactions with their teachers tend to be more socially anxious.

To date, no studies have examined the link between social inhibition and children's emotional security with their teachers. However, a negative association can be expected, for two reasons. First, social inhibition is related to insecure attachment representations (Rubin & Coplan, 2004; Shamir Essakow, Ungerer, & Rapee, 2005). Given associations between teacher-child and parent-child relationships (Howes & Hamilton, 1992; Pianta, Nimetz, & Bennett, 1997) it could be hypothesized that social inhibition is manifested in reduced emotional security with teachers. Second, teachers are important sources of feedback on children's behaviours and academic accomplishments. As inhibition comprises the fear of negative social evaluations, particularly from high-status figures (Buss, 1986; Rothbart & Mauro, 1990), inhibited students may often feel insecure in their classrooms, especially when interacting with their teachers (cf. Rimm Kaufman *et al.*, 2002).

Alongside personal characteristics such as social inhibition, specific circumstances are also likely to affect children's states of emotional security. Interactions with teachers may sometimes be perceived as stressful, but teachers are also the obvious candidates to relieve the stress of young children. As secondary attachment figures (Ainsworth, 1991), they can advance children's feelings of security by being supportive to them in stressful situations (see Hughes, Zhang, & Hill, 2006). The extent to which a teacher is encouraging and reassuring can be considered an important characteristic of a particular teacher-child interaction. This situational feature may increase children's feelings of security and counter the expected negative effect of social inhibition. Moreover, teachers' support can be expected to suppress (part of) this effect, as it seems that teachers are, or intend to be, extra supportive to socially inhibited children (Brophy & McCaslin, 1992; Evans, 2001; Thijs *et al.*, 2006).

EMOTIONAL SECURITY AND TASK BEHAVIOURS

Regulating feelings of insecurity requires time and energy, which children cannot devote to other purposes (Cummings & Davies, 1996; Davies & Cummings, 1998). Hence, it can be expected that a lack of emotional security thwarts children's involvement with external activities including their academic tasks (Boekaerts, 1993). Koomen *et al.* (2004) provided empirical support for this expectation. They observed kindergarten children who were trained in a picture categorization and recall task by either their own or a less familiar teacher. Children's displays of emotional security were assessed with a self-developed scale, which was based on observations of young children under stressful circumstances and focused on various insecure gestures and behaviours, including looking or turning away from the teacher, barely giving a response when asked a question, talking softly, and plucking at clothes. Consistent with their hypothesis, the researchers found that emotional security was positively related to children's task involvement (mean $r = 0.59$; Koomen *et al.*, 2004).

The present study focused on two task behaviours: children's independence from their teacher and children's task persistence. Both behaviours are considered important indicators of achievement motivation among young

children (Stipek & Greene, 2001). It was hypothesized that both indicators would be positively related to emotional security.

MEDIATION AND MODERATION

There is ample evidence that teachers can have a positive effect on the school-related motivation and the task behaviours of their pupils. Support comes from divergent strands of research, including studies of teachers' perceptions of the teacher-child relationship (Birch & Ladd, 1997; Hamre & Pianta, 2001; Pianta & Stuhlman, 2004), research into children's perceptions of their teachers (Hughes *et al.*, 2006; Murray & Greenberg, 2000; Skinner & Belmont, 1993), and independent observations of teacher-child interactions (Pianta *et al.*, 2002; Rimm Kaufman *et al.*, 2002). However, to our knowledge, no studies have examined how children's states of emotional security are implicated in the relationships between teachers' support and child motivation.

In this respect, two different complementary hypotheses can be formulated. First, as support from teachers is likely to increase children's emotional security, and emotional well-being is a prerequisite for motivated task behaviours (Boekaerts, 1993), it can be expected that a state of emotional security *mediates* part of the statistical influence of teachers' support on children's task behaviours (see Baron & Kenny, 1986). A comparable hypothesis has been advanced by motivational theorists who state that a sense of secure relatedness to one's social environment is one of the preconditions for self-directed motivation (Connell & Wellborn, 1991; Ryan & Deci, 2000b).

Second, it is reasonable to expect that emotional security *moderates* the impact of teachers' support on children's task behaviours. Relatedness or emotional well-being alone does not seem to be sufficient for motivated task behaviours (Koomen *et al.*, 2004). Therefore, security is unlikely to mediate all influences of their teachers. Instead, a lack of emotional security may also increase children's susceptibility to the influences of their teachers. Indirect support for this hypothesis comes from a study by Little and Kobak (2003), who found that children's emotional security with their teacher diminished the impact of teacher and peer events on their self-esteem. When children feel insecure, they need time and energy to regulate their emotional well-being. In that state, they are probably also more dependent on teachers' support and directions for the display of adequate task behaviours.

OVERVIEW OF THE PRESENT STUDY

The goal of the present study was to investigate the interrelations between emotional security, task behaviours (persistence and independence), social inhibition, and teachers' support in arranged dyadic interactions between kindergarten children and their teachers. A recruitment procedure was followed in which children were selected relative to their classmates. As a consequence, we could examine a sample in which many children were extremely inhibited, and in which social inhibition was normally distributed.

Children and teachers were observed in an arranged task interaction outside the classroom. Although this situation might have less ecological validity, it provided an outstanding opportunity to investigate the possible effects of teachers' behaviours without the presence of confounding classroom influences.

Moreover, it allowed us to examine children with different inhibition levels, who might otherwise have more or less frequent interactions with their teacher, under similar conditions (see Rimm Kaufman *et al.*, 2002).

Five specific hypotheses were addressed. Our first hypothesis was that emotional security would be positively predicted by teachers' support and negatively by social inhibition. However, as both variables were assumed to be positively related, the effect of teachers' support was expected to suppress the effect of social inhibition. Next, we expected that emotional security would be positively related to both task behaviours, i.e. both persistence and independence. Third, we expected that these task behaviours would be positively affected by teachers' support, and fourth, that this influence would be mediated in part by emotional security. Finally, we tested whether emotional security moderated (diminished) the effects of teachers' support on children's task behaviours.

METHOD

Participants and Procedure

Participants were 79 kindergarten children (42 boys and 37 girls; $M_{\text{age}} = 69.7$ months, S.D. = 8.4) and their 40 teachers. Most of the children ($n = 77$) were successfully selected as socially inhibited relative to their classmates. To select the children, teachers completed the Behavior Questionnaire for Two- to Six-Year-Olds-Modified (BQTSYO-M; Thijs *et al.*, 2004) for all children over five years old and if possible for all children in their classes, totalling 628 children. This instrument will be described below. Next, two children were selected in each class ($N = 40$) based on their behaviour scores relative to their classmates. Teachers were not informed about the selection guidelines or the intention to select children who were socially inhibited relative to their classmates. Children should be selected if, in their class, they scored highest on the BQTSYO-M scale for social inhibition and relatively low on hyperactivity and externalizing behaviour (preferably close to but below the class means). The latter measures were included to avoid problems of comorbidity. To facilitate this selection, children's BQTSYO-M scores were standardized relative to those of their classmates.

Owing to practical circumstances (e.g. absence of children, lack of parental permission) selection guidelines could not always be adhered to. Of the 80 initially selected children, 77 scored comparatively high on social inhibition (≥ 0.5 S.D. above the class means). However, as social inhibition was differently distributed across children's classrooms, their absolute scores comprised almost the full-scale range (1.3–4). On average, these children scored low on the standardized measures for hyperactivity and externalizing behaviour (respectively, $M = -0.49$, S.D. = 0.59, and $M = -0.52$, S.D. = 0.59). The three remaining children did not have high scores on social inhibition (< 0.5 S.D. above the class means). It was decided to include two of these children as they had low standardized scores (< -0.24) on hyperactivity and externalizing behaviour. This increased the power of our analyses and the full-scale range of social inhibition (1–4) was now present in the data.¹ Of the 79 included children, 34 could be considered extremely inhibited with their inhibition scores falling within the upper 10% in the total sample they were drawn from ($N = 628$). For none of the children, scores for hyperactivity or externalizing behaviour fell

within the upper 10% of the total sample. Figure 1 provides a graphic summary of the results of our selection procedure. Like the total sample ($N = 628$), the selected sample ($n = 79$) covered the full range of Social Inhibition. However, the distribution of this measure was more normal and far less skewed in the selected compared with the total sample. Thus, the selection had been successful.

Children and teachers were filmed with a camera during a dyadic interaction task which took place outside the classroom. They were seated at a table. Children were presented with different sets of three pictures on separate cards, e.g. a picture of a child in bed sleeping, a picture of an alarm clock, and a picture of the child awake and out of bed. Children had to place these pictures in a logical chronological order (most of the time it was clear what the second picture was), and tell a story corresponding to this order. Teachers were informed that we were interested in mutual interaction and were instructed to have children explain their stories. They were also encouraged to remove the last picture of a sequence and have children come up with an alternative ending to the story.

Eight independent observers rated videotapes of the interactions using six scales that will be described below. These raters (graduate students) were trained in the use of the scales on a subset of five video fragments taken from a pilot study. Raters scored each training fragment, discussed their scores with the other raters and the first author, and could adjust their scores after these discussions. Training stopped when agreement within one-scale point was reached. To assess interrater reliability, 18–70% of the interactions were independently coded by three groups of independent raters. Two raters assessed teachers' behaviours, three raters judged children's emotional security and independence, and three raters judged children's persistence. For each scale, interrater agreement was assessed by calculating intraclass correlation coefficient (ICC) for absolute agreement. The ICC can be conceptualized as the proportion of total variance that can be attributed to variation between the objects of measurement (McGraw & Wong, 1996). ICC values from 0.60 to 0.74 indicate good agreement, and values from 0.75 to 1.00 indicate excellent agreement (Cicchetti *et al.*, 2006).

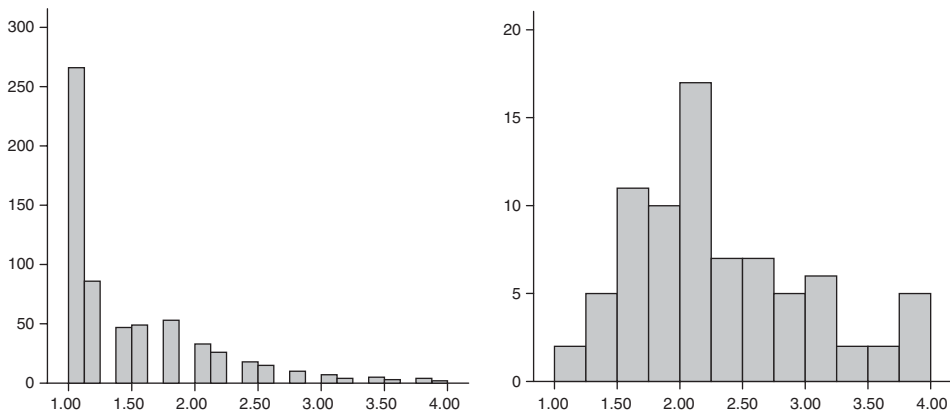


Figure 1. Frequency distributions of social inhibition for the entire sample (left) and the selected children (right).

Measures

BQTSYO-M: Teachers completed the BQTSYO- M (Thijs *et al.*, 2004) for 628 children. The BQTSYO-M is a short screening instrument containing small and broadband scales for internalizing and externalizing behaviours. In the present study, scales for social inhibition and hyperactivity, and the broadband scale for externalizing behaviour were used. Social inhibition consists of five items including 'Tries to avoid attention', 'Rather quiet does not say anything spontaneously', and 'Easily withdraws'. Hyperactivity contains four items including 'Has a poor concentration' and 'Restless'. Cronbach's α was 0.88 for social inhibition and 0.86 for hyperactivity. Externalizing behaviour contains the four items pertaining to hyperactivity, and nine additional items including 'Hits or kicks other children' and 'Disobedient'. Alpha was 0.93 for this scale. Further analysis revealed that the social inhibition scale was internally consistent for the group of selected children as well ($\alpha = 0.83$; $n = 79$).

Teachers' support: Teachers' behaviours were scored on three seven-point scales for supportive presence, autonomy support, and structure, which were derived from Erickson, Sroufe, and Egeland (1985) and adjusted for use within a school setting (Koomen *et al.*, 2004). Supportive presence ranged from *very low* (1) 'aloof, unavailable or hostile' to *very high* (7) 'rewarding success, encouraging, expressing confidence' throughout the session. Autonomy support ranged from *very low* (1) 'denying child's individuality, very intrusive, physical and forceful' to *very high* (7) 'acknowledging child's perspective and encouraging child to negotiate events'. Structure ranged from *very low* (1) 'failing to communicate expectations and showing no effective leadership' to *very high* (7) 'consistent and authoritative responding, and maintaining adequate leadership and discipline'.

Interobserver agreement was good to excellent for the three scales. ICC was 0.84 for supportive presence, 0.73 for autonomy support, and 0.66 for structure. As the three measures were strongly related ($r > 0.69$) they were averaged into one scale for teachers' support for which Cronbach's α was 0.92. Interrater agreement was excellent for this composite measure (ICC = 0.84).

Emotional security: Children's displays of emotional security were assessed with a seven-point observational scale developed by Koomen *et al.* (2004). This measure ranged from *very low* (1) 'feels insecure during the entire session and taken up by it completely, does not, or very softly, answer questions, may pluck at his/her clothes or may display other nervous gestures, makes an overall very passive, stressed, timid or shy impression' to *very high* (7) 'feels totally comfortable, does not show indications of shyness or stress, open and spontaneous in his/her reactions'. Interrater agreement was excellent (ICC = 0.81).

Task behaviours: Children's task behaviours were rated with seven-point scales for persistence and independence derived from Erickson *et al.* (1985) and adapted for use within a school setting (Koomen *et al.*, 2004). Persistence ranged from *very low* (1) 'actively tries to avoid the task, seems to want no part in it and tries to abandon it as soon as possible' to *very high* (7) 'is persistent virtually throughout the session, displays very little if any diversionary tactics, works at the task with the apparent goal of getting correct solutions in order to finish the task completely or to a sufficient degree'. Independence ranged from *very low* (1) 'seems preoccupied with obtaining help, may deliberately make an incorrect contribution to have teacher perform the task, displays little own initiative without assistance. Obtaining help appears to be the dominant strategy

throughout the session' to *very high* (7) 'has strong self-confidence, may ask for information or help but this always expresses own initiative, does not copy advice indiscriminately but integrates it in own initiatives'. ICC was 0.72 for persistence, and 0.89 for independence.

Data Analysis

For all children but one data were not independent, as they had the same teacher as another child in the sample. Analysing dependent data with conventional statistical tests could lead to an underestimation of standard errors and hence to spuriously significant results (Snijders & Bosker, 1999). To prevent this, we conducted multilevel analyses. Multilevel analysis corrects for dependencies between observations nested within the same units and can handle variable numbers of observations per unit (Snijders & Bosker, 1999). Multilevel regression models were tested with MLwiN version 2.0 (Rasbash, Browne, Healy, Cameron, & Charlton, 2004) using the unrestricted maximum likelihood estimation method. Two levels were specified: the child level (Level 1) and the teacher level (Level 2). As both persistence and independence were examined as task behaviours and they were strongly related ($r = 0.76$), they were analysed simultaneously using multivariate models. For this purpose, an additional level was specified: Level 0, the within child level (Snijders & Bosker, 1999). Unless otherwise indicated, effects on persistence and independence were similar in all analyses.

RESULTS

Preliminary Analyses

Two sets of preliminary analyses were conducted. First, simple correlations among social inhibition and the observed variables were inspected (see Table 1). Social Inhibition was unrelated to all observed child variables, but positively related to teachers' support. Teachers' support was positively related to emotional security and both persistence and independence, which were positively related themselves. Emotional security was positively related to both task behaviours. Second, it was explored whether boys and girls had different scores on social inhibition or the observed variables. To this aim, multilevel analyses were performed in which gender was included as a dummy variable (coded 0 for boys and 1 for girls). This yielded a significant ($p < 0.01$) effect for task behaviours only: compared with boys, girls were observed to be less persistent ($M = 4.73$, S.D. = 1.35, versus $M = 5.40$, S.D. = 1.35) and less independent ($M = 3.46$, S.D. = 1.35, versus $M = 4.15$, S.D. = 1.27). To account for these differences, gender was included as a covariate in the following analyses.²

Direct Effects of Teachers' Support

Next, multilevel analyses were conducted to examine the unique effects of teachers' support on emotional security, persistence, and independence. For ease of interpretation, all continuous variables were standardized. Analyses proceeded in two steps. First, each observed child variable was regressed on gender

Table 1. Intercorrelations, means, and S.D.'s for social inhibition and observed variables

	1	2	3	4	M	S.D.
1. Social inhibition					2.29	0.72
2. Teachers' support	0.30**				4.52	0.95
3. Emotional security	−0.10	0.55**			3.81	1.12
4. Persistence	−0.15	0.55**	0.53**		5.09	1.38
5. Independence	0.01	0.56**	0.63**	0.76**	3.82	1.34

* $p < 0.05$, ** $p < 0.01$.

Table 2. Multilevel prediction of emotional security and task behaviours from social inhibition and teachers' support

	Emotional security		Persistence and independence			
	Model 1	Model 2	Model 1		Model 2	
			Persistence	Independence	Persistence	Independence
<i>Predictors</i>						
Gender	−0.28	−0.06	−0.49*	−0.49*	−0.30*	−0.30*
Social inhibition	−0.08	−0.28**	−0.12	0.03	−0.34**	−0.20
Teachers' support		0.63**			0.68**	0.68**
<i>Variance</i>						
Level 1 (child)	0.96	0.62	0.83	0.81	0.53	0.41
Level 2 (teacher)	0.00	0.00	0.09	0.11	0.05	0.22
Total	0.96	0.62	0.92	0.92	0.58	0.63
<i>Deviance</i>						
	220.82	186.00	366.11	366.11	321.18	321.18

Note: There was no variance at Level 0 for persistence and independence as this within-child level was only included to define the multivariate structure. Gender is a dummy variable, with girls = 1 and boys = 0. * $p < 0.05$, ** $p < 0.01$.

(as a covariate) and social inhibition (Model 1). Next, teachers' support was entered as a predictor (Model 2). Results are displayed in Table 2.

In Model 1, there were no significant effects of social inhibition.^{3,4} In Model 2, teachers' support had a positive effect on emotional security and a positive effect on persistence and independence. These effects were considerable, explaining roughly a third of the total variance of the child measures (see Table 2). When support was added to the model, social inhibition had a significant negative effect on emotional security. In addition, it had a negative effect on persistence and a marginally significant negative effect on independence ($p < 0.06$). As social inhibition and support were positively related (see Table 1), these findings indicated that teachers' support suppressed the effects of social inhibition. Teachers tended to be more supportive towards children with higher levels of social inhibition. However, under conditions of equal support, these children showed reduced emotional security and diminished task persistence compared with children with lower inhibition levels.

Mediation and Moderation Effects

Because emotional security was positively related to all other observed variables, we could examine whether it mediated (part of) the links between teachers'

support and children's task behaviours (see Baron & Kenny, 1986). To this end, persistence and independence were regressed on emotional security in addition to support, gender, and social inhibition. Results are displayed in the left part of Table 3 (Model 3). It appeared that emotional security had a positive effect on persistence and independence. When this variable was included as a predictor, the effect of support was reduced: from $b = 0.68$ (Table 2) to $b = 0.40$ (Table 3). This suggested that security partially mediated the influence of teachers' support on children's task, behaviour.

To substantiate this suggestion, the indirect effect of teachers' support was examined in SPSS by means of a bootstrapping procedure provided by Preacher and Hayes (2004).⁵ This procedure was preferred over the Sobel test, because sample size was relatively small (Preacher & Hayes, 2004). As emotional security had different effects on task persistence and independence, separate tests were conducted for each of them. Results indicated that, once the effects of gender and social inhibition, were partialled out, emotional security carried a significant portion of the influences of teachers' support on task persistence ($b = 0.14$, $p < 0.05$) and independence ($b = 0.24$, $p < 0.01$).

Finally, we tested the hypothesis that teachers' support interacted with emotional security in their effects on children's task behaviours. For this purpose, an interaction term was computed by multiplying our (standardized) measures for support and security. This measure was standardized and added to the multilevel regression model. Results are displayed in the right part of Table 3 (Model 4). The interaction effect appeared to be different for independence and persistence and only significant for the latter ($p < 0.05$).

To investigate the nature of this interaction, simple slope analyses were conducted (Aiken & West, 1991). The effects of teachers' support were computed for children who displayed low and high levels of emotional security (1 S.D. below and 1 S.D. above the mean, respectively). It appeared that support had

Table 3. Multilevel prediction of task behaviours from social inhibition, teachers' support, and emotional security

	Persistence and independence			
	Model 3		Model 4	
	Persistence	Independence	Persistence	Independence
<i>Predictors</i>				
Gender	-0.29*	-0.29*	-0.29*	-0.29*
Social inhibition	-0.22*	-0.06	-0.24**	-0.09
Teachers' support	0.40**	0.40**	0.42**	0.42**
Emotional security	0.27**	0.44**	0.25**	0.43**
Emotional security \times support			-0.13*	-0.05
<i>Variance</i>				
Level 1 (child)	0.55	0.34	0.51	0.27
Level 2 (teacher)	0.00	0.13	0.00	0.24
Total	0.55	0.47	0.55	0.51
<i>Deviance</i>	308.00	308.00	297.278	297.278

Note: There was no variance at Level 0 for persistence and independence as this within-child level was only included to define the multivariate structure. Gender is a dummy variable, with girls = 1 and boys = 0. * $p < 0.05$, ** $p < 0.01$.



Figure 2. Interaction effect of teacher's support and emotional security on persistence.

stronger effects for children in the first compared with the second group ($b = 0.60$, $p < 0.01$, versus $b = 0.35$, $p < 0.01$, respectively). The interaction is displayed in Figure 2.

DISCUSSION

This study examined the role of emotional security in dyadic task-related interactions between kindergarten children and their teachers. The research had a cross-sectional design and hence could not demonstrate causal relations. However, our interpretation of the direction of effects is consistent with theoretical expectations and other research findings. Most of our hypotheses were confirmed, highlighting the relevance of the security approach for understanding young children's academic functioning.

Our first finding was that teachers' support shared a strong, positive link with children's emotional security; partialling out this link revealed a negative relation between social inhibition and security. Thus, it seemed that children felt more secure when their teachers were observed to be more supportive, and when they were generally less inhibited. However, the latter effect was suppressed by the former. Teachers showed more adequate support towards children they rated as more inhibited, which is consistent with studies demonstrating that, by their own accounts, teachers are extra supportive to inhibited children (Brophy & McCaslin, 1992; Thijs *et al.*, 2006). Our findings strongly support the notion that children's emotional security in a specific social context reflects a transaction between children's personal characteristics and situational aspects (Cummings & Davies, 1996; Davies & Cummings, 1998). On the one hand, under conditions of equal support, interactions with teachers seemed to be more stress provoking for children with higher levels of social inhibition. Inhibited children fear challenging and evaluative social situations, and interactions with teachers seem to be part of this category (Buss, 1986; Rothbart & Mauro, 1990). On the other hand, teachers seemed to be able to increase children's felt security, which substantiates the notion that teachers can function as secondary attachment

figures to young children, providing them with support in times of stress (Pianta, 1992; van IJzendoorn *et al.*, 1992).

Second, as expected, we found that emotional security was positively related to children's task behaviours. Children who displayed more emotional security showed more task persistence and also more independence. These findings appear to be consistent with the idea that emotional well-being or secure relatedness is a precondition for motivated learning behaviour (Connell & Wellborn, 1991; Ryan & Deci, 2000a,b). Somewhat unexpected, the relation between emotional security and independence appeared to be stronger than that between security and persistence. Possibly, this finding reflects the fact that the different measures assessed different orientations. Unlike persistence, which involved children's focus on their task, both independence and emotional security involved children's relation to their teacher. This shared feature of the latter measures might have increased the relation between them. A less interesting explanation is that both independence and emotional security were assessed by the same raters leading to shared method variance. To rule out this explanation, future observational studies on emotional security and different task behaviours should use independent ratings of these constructs.

Consistent with our third hypothesis, there were strong, positive relations between children's persistence and independence, and the support received from their teacher. These relations add to the body of evidence that teachers can have a significant influence on children's task motivation. When the statistical influence of teachers' support was partialled out, social inhibition also appeared to be negatively related to children's task behaviours, their persistence in particular. This finding agrees with previous research indicating that socially anxious children show relatively little self-reliance (e.g. initiative and persistence; Rimm Kaufmann *et al.*, 2002), and little initiative and independence in interactions with their teachers (Birch & Ladd, 1998; Ladd & Burgess, 1999; Coplan & Prakash, 2003).

Our fourth hypothesis received confirmation as well. The relation between teachers' support and children's task behaviours was mediated in part by emotional security. Thus, our analyses indicated that teachers' support enhances children's task engagement, partly because it fosters feelings of security. At the same time, emotional security did not fully explain the link between support and task behaviours. The unique statistical effects of support on independence and persistence suggest that teachers can fulfil other (psychological) preconditions for motivated task behaviours. This is consistent with theories stating that not only feelings of relatedness or security but also feelings of autonomy and competence are essential for self-directed motivation (Connell & Wellborn, 1991; Ryan & Deci, 2000a,b). Examining these other preconditions was beyond the scope of the present study but is an important goal for future research.

Our fifth and last hypothesis received partial support. Teachers' support and emotional security interacted in their effects on task persistence. It seemed that persistent behaviours were more contingent on support for children who felt relatively insecure. For children who experienced more security, the statistical effect of support was positive but smaller. Thus, our results suggest that emotional insecurity amplifies the importance of teachers for children's task orientation. As emotion regulation requires time and energy, children who felt insecure had probably less own resources to cope with the demands of the task (cf. Cummings & Davies, 1996; Davies & Cummings, 1998). Teachers' supporting and directing behaviours appeared to be especially important for the task approaches of these children. For independence, a comparable interaction effect

was not obtained. We do not have a clear-cut explanation for this but a tentative speculation can be made. Consistent with previous research (Little & Kobak, 2003), our findings for persistence suggest that insecurity did increase children's susceptibility to influences from their teacher (cf. Little & Kobak, 2003). However, this susceptibility might imply a higher level of dependence, which, in itself, might constrain children's independent task behaviour or teachers' impact on them. Of course, more specific research would be needed to explore and confirm this interpretation.

Emotional security entails multiple component processes, including emotional reactivity, motivation, and representations of important relationships (Davies & Cummings, 1998). In the present study, we focused on observable behavioural aspects of emotional security. These aspects were assumed to reflect the immediate transaction between children's personal characteristics and their environment (cf. Cummings & Davies, 1996). The combined effects of teachers' support and children's inhibited disposition were clearly consistent with this assumption. In addition to this, it is likely that the reduced security displayed by children with higher levels of social inhibition reflected to some extent the (in)security of their attachment representations (Rubin & Coplan, 2004; Shamir Essakow *et al.*, 2005). Future research is needed to examine the influence of these representations, which we did not assess in the present study.

Most of the children in the present sample were socially inhibited relative to their classmates. However, low levels of externalizing behaviour were reported for them as well. Whether emotional security is equally important in the interactions between teachers and children characterized by other (e.g. externalizing) behaviours is a matter of speculation. On average, these children probably show low rates of insecurity. However, as a state, emotional security can be influenced by a host of internal and external factors that are not restricted to inhibited children (see Cummings & Davies, 1996). Accordingly, the statistical effect of social inhibition explained only a moderate portion of the variance in emotional security after the statistical influence of support was partialled out. Other research (Koomen *et al.*, 2004; Little & Kobak, 2003) suggests that security has similar effects on task behaviours of randomly selected children.

Three qualifications should be considered to evaluate the present study. First, as noted, the study is limited by its cross-sectional design. To draw definite conclusions about causality in situations like the present, time-series analyses are needed. However, these analyses require data for many short intervals, whereas relatively long time periods were needed to assess the constructs in the present study. For instance, children's state of emotional security was inferred from various signs and behaviours, which were not necessarily displayed at the same time. In addition to this, there are arguments that support our interpretation of the direction of effects. As teachers are trained and expected to attend to children's needs, it seems unlikely that they were less supportive to children who displayed stronger emotional and task-related needs. Thus, the reverse direction of effects is implausible. Moreover, children with higher levels of social inhibition received more teachers' support and showed reduced emotional security once the statistical influence of support was partialled out. Thus, it seems reasonable to conclude that teachers' support increased their feelings of security.

Second, the observations required that teachers and children interacted for longer periods of time outside the classroom. It could be argued that the present findings do not generalize to children's daily classroom experiences, especially those of more children who might eschew interactions with their teachers

(cf. Coplan & Prakash, 2003; Rimm Kaufmann *et al.*, 2002). Future research should examine children's displays of emotional security in the presence of teachers and other children in classroom. Still, the arranged nature of the observation situation made it possible to examine the effects of teachers under comparable circumstances for all children. Thus, although this feature challenged the ecological validity of our observations, it did increase their internal validity.

Third, the study pertained to only one observation for each child. Although we were interested in emotional security as a state, an important question is whether the observed states were typical for children in these or similar circumstances. At present, we are unable to provide an answer to this question. However, results by Koomen *et al.* (2004) suggest that children experience similar levels of security in similar situations. These authors used the same observation scale for emotional security and found strong correlations ($r \geq 0.63$) between security ratings in similar group task situations scheduled one week apart (Koomen *et al.*, 2004).

Despite these qualifications and limitations, we think that the present study is important as it highlights the utility of the emotional security approach for examining the interactions between kindergarten children and their teachers. Consistent with the approach, children's security in these interactions appeared to reflect a transaction between social inhibition (a personal characteristic) and teachers' support (a contextual factor). In addition to this, the mediation and moderation findings indicate that the security construct adds to the understanding of teachers' influences on the task behaviours of their young pupils. Future research should build upon the present work by further examining the role of emotional security in the school experiences of kindergarten children.

ACKNOWLEDGEMENTS

We would like to thank the Netherlands Organization for Scientific Research for supporting this research through grant 41103011.

Notes

1. Analyses without these two relatively non-inhibited children yielded virtually the same results.
2. In the following analyses, it was also explored whether Gender interacted with each of the predictor variables. This was not the case.
3. Although Social Inhibition was unrelated to both persistence and independence, its effects on these variables were significantly different ($p < 0.05$) and, hence, these effects were estimated separately.
4. Because Gender was included as a covariate, its unique effects (Tables 2 and 3) are not discussed in the text.
5. We thank an anonymous reviewer for suggesting this procedure.

REFERENCES

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.

- Ainsworth, M. D. S. (1991). Attachments and other affectional bonds across the life cycle. In C. M. Parkes, J. Stevenson Hinde, & P. Marris (Eds.), *Attachment across the life cycle* (pp. 33–51). New York: Tavistock/Routledge.
- Asendorpf, J. B. (1993). Beyond temperament: A two-factorial coping model of the development of inhibition during childhood. In K. H. Rubin, & J. B. Asendorpf (Eds.), *Social withdrawal, inhibition, and shyness in childhood* (pp. 265–289). Hillsdale, NJ: Erlbaum.
- Barnas, M. V., & Cummings, E. M. (1994). Caregiver stability and toddlers' attachment-related behavior towards caregivers in day care. *Infant Behavior and Development*, 17, 141–147.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.
- Birch, S. H., & Ladd, G. W. (1997). The teacher–child relationship and children's early school adjustment. *Journal of School Psychology*, 35, 61–79.
- Birch, S. H., & Ladd, G. W. (1998). Children's interpersonal behaviors and the teacher–child relationship. *Developmental Psychology*, 34, 934–946.
- Boekaerts, M. (1993). Being concerned with well-being and with learning. *Educational Psychologist*, 28, 149–167.
- Brophy, J., & McCaslin, M. (1992). Teachers' reports of how they perceive and cope with problem students. *Elementary School Journal*, 93, 3–68.
- Buss, A. H. (1986). A theory of shyness. In W. H. Jones, J. M. Cheek, & S. R. Briggs (Eds.), *Shyness: Perspectives on research and treatment* (pp. 39–46). New York: Plenum.
- Cicchetti, D., Bronen, R., Spencer, S., Haut, S., Berg, A., Oliver, P., et al. (2006). Rating scales, scales of measurement, issues of reliability: Resolving some critical issues for clinicians and researchers. *Journal of Nervous and Mental Disease*, 194, 557–564.
- Connell, J. P., & Wellborn, J. G. (1991). Competence, autonomy, and relatedness: A motivational analysis of self-system processes. In M. R. Gunnar, & L. A. Sroufe (Eds.), *Self processes and development* (Vol. 23, pp. 43–77). Hillsdale, NJ: Erlbaum.
- Coplan, R. J., & Prakash, K. (2003). Spending time with teacher: Characteristics of preschoolers who frequently elicit versus initiate interactions with teachers. *Early Childhood Research Quarterly*, 18, 143–158.
- Coplan, R. J., Prakash, K., O'Neil, K., & Armer, M. (2004). Do you 'want' to play? Distinguishing between conflicted shyness and social disinterest in early childhood. *Developmental Psychology*, 40, 244–258.
- Coplan, R. J., & Rubin, K. H. (1998). Exploring and assessing nonsocial play in the preschool: The development and validation of the Preschool Play Behavior Scale. *Social Development*, 7, 72–91.
- Coplan, R. J., Rubin, K. H., Fox, N. A., Calkins, S. D., & Stewart, L. S. (1994). Being alone, playing alone, and acting alone: Distinguishing among reticence and passive and active solitude in young children. *Child Development*, 65, 129–137.
- Crozier, W. R. (1999). Individual differences in childhood shyness: Distinguishing fearful and self-conscious shyness. In L. A. Schmidt, & J. Schulkin (Eds.), *Extreme fear, shyness, and social phobia: Origins, biological mechanisms, and clinical outcomes* (pp. 14–29). New York: Oxford University Press.
- Cummings, E. M., & Davies, P. (1996). Emotional security as a regulatory process in normal development and the development of psychopathology. *Development and Psychopathology*, 8, 123–139.
- Davies, P. T., & Cummings, E. M. (1994). Marital conflict and child adjustment: An emotional security hypothesis. *Psychological Bulletin*, 116, 387–411.
- Davies, P. T., & Cummings, E. M. (1998). Exploring children's emotional security as a mediator of the link between marital relations and child adjustment. *Child Development*, 69, 124–139.
- Erickson, M. F., Sroufe, L. A., & Egeland, B. (1985). The relationship between quality of attachment and behavior problems in preschool in a high-risk sample. In I. Bretherton, & E. Waters (Eds.), *Growing points of attachment theory and research. Monographs of the society for research in child development* (Vol. 50, pp. 147–166). Oxford: Blackwell.
- Evans, M. A. (2001). Shyness in the classroom and home. In L. E. Alden, & W. R. Crozier (Eds.), *International handbook of social anxiety: Concepts, research and interventions relating to the self and shyness* (pp. 159–183). New York: Wiley.

- Gazelle, H., & Ladd, G. W. (2003). Anxious solitude and peer exclusion: A diathesis-stress model of internalizing trajectories in childhood. *Child Development*, 74, 257–278.
- Hamre, B. K., & Pianta, R. C. (2001). Early teacher–child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, 72, 625–638.
- Howes, C., & Hamilton, C. E. (1992). Children's relationships with child care teachers: Stability and concordance with maternal attachment. *Child Development*, 53, 879–892.
- Howes, C., Hamilton, C. E., & Matheson, C. C. (1994). Children's relationships with peers: Differential associations with aspects of the teacher–child relationship. *Child Development*, 65, 253–263.
- Hughes, J. N., Zhang, D., & Hill, C. R. (2006). Peer assessments of normative and individual teacher–student support predict social acceptance and engagement among low-achieving children. *Journal of School Psychology*, 43, 447–463.
- Kagan, J. (1997). Temperament and the reactions to unfamiliarity. *Child Development*, 68, 139–143.
- Koomen, H. M. Y., & Hoeksma, J. B. (2003). Regulation of emotional security by children after entry to special and regular kindergarten classes. *Psychological Reports*, 93, 1319–1334.
- Koomen, H. M. Y., van Leeuwen, M. G. P., & van der Leij, A. (2004). Does well-being contribute to performance? Emotional security, teacher support and learning behaviour in kindergarten. *Infant and Child Development*, 13, 253–275.
- Ladd, G. W., & Burgess, K. B. (1999). Charting the relationship trajectories of aggressive, withdrawn, and aggressive/withdrawn children during early grade school. *Child Development*, 70, 910–922.
- Little, M., & Kobak, R. (2003). Emotional security with teachers and children's stress reactivity: A comparison of special-education and regular-education classrooms. *Journal of Clinical Child and Adolescent Psychology*, 32, 127–138.
- McGraw, K. O., & Wong, S. P. (1996). Forming inferences about some intraclass correlation coefficients. *Psychological Methods*, 1, 30–46.
- Murray, C., & Greenberg, M. T. (2000). Children's relationship with teachers and bonds with school. An investigation of patterns and correlates in middle childhood. *Journal of School Psychology*, 38, 423–445.
- Pianta, R. C. (1992). Conceptual and methodological issues in research on relationships between children and nonparental adults. *New Directions for Child Development*, 57, 121–129.
- Pianta, R. C., La Paro, K. M., Payne, C., Cox, M. J., & Bradley, R. (2002). The relation of kindergarten classroom environment to teacher, family, and school characteristics and child outcomes. *Elementary School Journal*, 102, 225–238.
- Pianta, R. C., Nimetz, S. L., & Bennett, E. (1997). Mother–child relationships, teacher–child relationships, and school outcomes in preschool and kindergarten. *Early Childhood Research Quarterly*, 12, 263–280.
- Pianta, R. C., & Stuhlman, M. W. (2004). Teacher–child relationships and children's success in the first years of school. *School Psychology Review*, 33, 444–458.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36, 717–731.
- Rasbash, J., Browne, W., Healy, M., Cameron, B., & Charlton, C. (2004). *MLwiN, Version 2.0*. New York: Multilevel Models Project Institute of Education.
- Rimm Kaufman, S. E., Early, D. M., Cox, M. J., Saluja, G., Pianta, R. C., Bradley, R. H., et al. (2002). Early behavioral attributes and teachers' sensitivity as predictors of competent behavior in the kindergarten classroom. *Journal of Applied Developmental Psychology*, 23, 451–470.
- Rothbart, M. K., & Mauro, J. A. (1990). Temperament, behavioral inhibition, and shyness in childhood. In H. Leitenberg (Ed.), *Handbook of social and evaluation anxiety* (pp. 139–160). New York: Plenum Press.
- Rubin, K. H., Burgess, K. B., & Hastings, P. D. (2002). Stability and social-behavioral consequences of toddlers' inhibited temperament and parenting behaviors. *Child Development*, 73, 483–495.
- Rubin, K. H., & Coplan, R. J. (2004). Paying attention to and not neglecting social withdrawal and social isolation. *Merrill Palmer Quarterly*, 50, 506–534.

- Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25, 54–67.
- Ryan, R. M., & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68–78.
- Shamir Essakow, G., Ungerer, J. A., & Rapee, R. M. (2005). Attachment, behavioral inhibition, and anxiety in preschool Children. *Journal of Abnormal Child Psychology*, 33, 131–143.
- Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology*, 85, 571–581.
- Snijders, T. A. B., & Bosker, R. J. (1999). *Multilevel analysis. An introduction to basic and advanced multilevel modeling*. London: Sage.
- Stipek, D. J., & Greene, J. K. (2001). Achievement motivation in early childhood: Cause for concern or celebration? In S. L. Golbeck (Ed.), *Psychological perspectives on early childhood education: Reframing dilemmas in research and practice* (pp. 64–91). Mahwah, NJ: Erlbaum.
- Thijs, J. T., Koomen, H. M. Y., de Jong, P. F., van der Leij, A., & van Leeuwen, M. G. P. (2004). Internalizing behaviors among kindergarten children: Measuring dimensions of social withdrawal with a checklist. *Journal of Clinical Child and Adolescent Psychology*, 33, 802–812.
- Thijs, J. T., Koomen, H. M. Y., & van der Leij, A. (2006). Teachers' self-reported pedagogical practices toward socially inhibited, hyperactive, and average children. *Psychology in the Schools*, 43, 635–651.
- van den Oord, E. J. C. G., Pickles, A., & Waldman, I. D. (2003). Normal variation and abnormality: An empirical study of the liability distributions underlying depression and delinquency. *Journal of Child Psychology and Psychiatry*, 44, 180–192.
- van IJzendoorn, M. H., Sagi, A., & Lambermon, M. W. E. (1992). The multiple caretaker paradox: Data from Holland and Israel. *New Directions for Child Development*, 57, 5–24.